

PHASEOLIN: VARIABILITY AND REFERENCE MATERIALS IN WILD AND CULTIVATED COMMON BEAN

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Introduction

Phaseolin has proven to be a particularly informative marker in studies of genetic diversity and evolutionary pathways in common bean, for both wild and cultivated forms (Gepts, 1993). The purpose of this note is to report on phaseolin types not published previously and to extend information on types already published (Gepts & Bliss, 1986; Gepts et al. 1986; Koenig et al. 1990; Toro et al. 1990; Debouck et al. 1993; Tohme et al. 1995; Beebe et al. 1997; Ocampo & Toro, 2005), with indication of source materials, available internationally as genetic stocks, and maintained by CIAT Genetic Resources Unit as inbred materials.

Materials and Methods

The accessions, which are reported here, were obtained from the world-wide collection held in CIAT (Table 1). The samples were analyzed in ID-SDS-PAGE (Brown et al. 1981) and confirmed later in 2D-IEF-SDS-PAGE (O'Farrel, 1975).

Results and Discussion

Although this globulin has a narrow range of molecular weight (45-52 kD) and isoelectric point, a total of 62 banding patterns has been found so far, 30 being present in Mesoamerica, 21 in the Andean region, 8 in Colombia, and 3 in both Mesoamerica and Colombia. In relation to biological status, 38 patterns have been found in wild materials, 5 patterns in weedy forms and 19 patterns in cultivated materials (Table 1). Domestication that has been shown to happen in both major gene pools (Chacon et al. 2005), led to a reduction of phaseolin diversity or founder effect, perhaps stronger in Mesoamerica as compared to the Andean zone (our results, and Gepts, 1993). While the founder effect might be lesser than initially thought (Gepts, 1993; Sonnante et al. 1994), new phaseolin types continue to be found, namely in Colombia, suggesting more research in this area.

Table 1. Diversity of phaseolins and reference materials in wild, weedy and cultivated common beans (*Phaseolus vulgaris* L.).

No.	Phaseolin Types	Number G	Reference materials (Phs morphotypes)	Biological Status ¹	Genetic Pool ²	Country of origin ³
1	S	G12853	FI-2380	WILD	M	GTM
2	Sb	G12952	FI-5416	WILD	M	MEX
3	Sd	S33761	FI-2881	CULT	M	COL
4	M1	G23418	FI-5824	WILD	M	CRI
5	M2	G23652	FI-1930	WILD	M	MEX
6	M3	G12865	FI-1389	WILD	M	MEX
7	M4	G23678	FI-1697	WILD	M	MEX
8	M5	G12851	FI-4068	WILD	M	GTM
9	M6	G24365	FI-1712	WILD	M	MEX
10	M7	G12869	FI-1415	WILD	M	MEX
11	M8	G12879	FI-4414	WILD	M	MEX
12	M9	G12878	FI-1457	WILD	M	MEX
13	M10	G11034	FI-1363	WILD	M	MEX
14	M11	G50869	FI-3657	WDY	M	COL
15	M12	G10002	FI-1304	WILD	M	MEX
16	M13	G23439	FI-3144	WILD	M	GTM
17	M14	G12853	FI-1247	WILD	M	GTM
No.	Phaseolin Types	Number G	Reference materials (Phs morphotypes)	Biological Status ¹	Genetic Pool ²	Country of origin ³
18	M15	G24365	FI-1714	WILD	M	MEX

19	M16	G50726	FI-3976	WILD	M	HND
20	M17	G12882A	FI-1504	WILD	M	MEX
21	M18	G12855A	FI-2390	WILD	M	GTM
22	M19	G12854	FI-3349	WILD	M	GTM
23	M20	G24584	FI-5419	WILD	M	MEX
24	M21	G2721	FI-4045	CULT	M	PER
25	M22	G23511A	FI-1629	WILD	M	MEX
26	M23	G12890	FI-4089	WILD	M	MEX
27	M24	G12949	FI-1923	WILD	M	MEX
28	M25	G12851	FI-4070	WILD	M	GTM
29	M26	G23434A	FI-28	WDY	M	GTM
30	Dur	G11027A	MEXDU-01	WILD	M	MEX
31	T	G50015B	FI-2838	WDY	A	ARG
32	C	G21194	FI-4188	WILD	A	ARG
33	H1	G51049	FI-2753	CULT	A	COL
34	H2	G50401	FI-2514	CULT	A	COL
35	Ca	G12857	FI-1747	WILD	A	PER
36	Ca1	G50850	FI-3847	CULT	A	COL
37	To1	G24776	FI-4454	CULT	A	COL
38	To2	G23786B	FI-4456	CULT	A	PER
39	Ta	G23445	FI-1029	WILD	A	BOL
40	Nu	G12573	FI-13059	CULT	A	PER
41	K	G23422	FI-4105	CULT	A	PER
42	Ko	G23814	FI-4655	CULT	A	PER
43	J1	G19895	FI-998	WILD	A	ARG
44	J2	G23592	FI-934	WILD	A	ARG
45	J3	G19902	FI-976	WILD	A	ARG
46	J4	G21194	FI-4190	WILD	A	ARG
47	P1	G23423	FI-1805	WILD	A	PER
48	Pa	G23455	FI-1831	WILD	A	PER
49	I	G21244	FI-1	WILD	A	PER
50	A	G12857	FI-1748	WILD	A	PER
51	A1	G12078	FI-4842	CULT	A	PER
52	L	G24408	FI-2121	WILD	COL	COL
53	LI	G51019	FI-2493	CULT	COL	COL
54	CAR	G50843	FI-2432	CULT	COL	COL
55	HE	G51006	FI-2490	CULT	COL	COL
56	TI1	G51048	FI-2849	CULT	COL	COL
57	TI2	G51036	FI-2896	CULT	COL	COL
58	Mu	G50983	FI-4495	WDY	COL	COL
59	Qui	G24674	FI-4421	CULT	COL	COL
60	B	G24717	FI-2038 F2	CULT	M/COL	COL
61	CH	G50886	FI-3716 F2	WDY	M/COL	COL
62	Tel	G18970	FI-5791	CULT	M/COL	CRI

¹Biological Status: WILD (Wild), WDY (Weedy), CULT (Cultivated); ²The common bean genetic pools (Tohme et al. 1996): M (Mesoamerican); A (Andean); COL (Colombia). ³Country of origin: MEX (Mexico), GTM (Guatemala), HND (Honduras), CRI (Costa Rica), COL (Colombia), PER (Peru), BOL (Bolivia), ARG (Argentina).

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